Amherst Historical Commission- 332 West St.

- Cost estimate drawn from North Amherst Community Farm. Need more clarity on the cost. Explain how NACF study was used to get this cost estimate.
  Please see the attached report. The Commission adjusts the estimate to approximately $82,000 based on the report.

- Reference that barn may be used by Grow Food Amherst, but not clear about ultimate use and benefit to the Town. Is there social good coming from restoration of the barn?
  The Amherst Master Plan and Historic Preservation Plan emphasize the importance of the community' agricultural past that is embodied in the landscape and extant structures such as barns. Retaining the historic character of town serves an economic purpose (cultural tourism) and as a physical reminder of the past, it educates the public about Amherst's agrarian roots. In addition, this vestige of Amherst's agricultural past was constructed as a tobacco barn, and then was converted to a dairy barn to meet the changing needs of its owners. This makes the structure more interesting as it reflects the changing face of agriculture in the town over the last century. It is also one of the few tobacco barns left in Amherst that is located in such a highly visible location. It, along with the preserved land around it creates a window onto our past that will be lost if we do not act.

- Explain better who will own and use the barn in the future—this is presently a privately owned barn
  CPA funds can be used to preserve historically significant structures and artifacts, even if they are privately owned: *"The bottom line is this: CPA funds can be used to fund a project on private property if the project is advancing a public purpose, such as the public acquiring a deed restriction, providing public access to the property or some other benefit"* (http://www.communitypreservation.org/enews/FundPrivateProjectsJP.htm). **The barn may remain private property; however, the Town would hold a permanent preservation restriction on the structure that would require maintenance and upkeep such that the structure would remain standing for many years.**

- Would the $70,000 actually be enough to do a satisfactory restoration? Barn seems to be in very poor condition from external view.
  Please see attached barn report. The revised estimate of $82,000 is for the complete restoration of the barn to fix stability issues, replace the siding and roof, and restore it to stable condition.

- Would be helpful to see more public access delineated – seems vague and non-committal at this point.
  The barn has been a fixture of the landscape along West Street (Route 116) for almost 100 years. The barn and property, along with the farm across the street, were two of the original farms in this area. As a visual landmark that is in plain view from West Street, the public access at this time is the view of the barn in its original location with

preserved land surrounding it; it preserves part of the heritage of the community in its original setting. This is similar to the restoration of paintings at the Jones Library, and the stained glass window at the Unitarian Society, which are both using CPA funds. The paintings are part of the collection and may not be viewed all the time, while the stain glass window and barn are viewable at all times. The Town's securing a preservation restriction on the property also serves a public purpose.

It is important to note that the owners were excited by the discussion of Grow Food Amherst or another community organization using the barn for storage or for program space. The owners have limited resources to solicit organizations and agencies that would use the barn, but they seem amenable to its use by others.

- Please provide detailed estimates of costs and who would do the work.
  See attached report. The work would be bid to try and receive three quotes. At this time a contractor has not been selected.

- Does the Historical Commission have any other potential projects coming up that we may want to set aside funds for?
  No, this is a priority for the Commission. The preliminary list of inventoried outbuildings includes this barn and the Historical Commission determined that the barn is historically significant and issued a 12-month demolition delay.

- Are the owners willing/able to wait until the Outbuilding Study is done? What priority would this building be?
  The preliminary list of inventoried outbuildings includes this barn and the Historical Commission determined that the barn is historically significant and issued a 12-month demolition delay, during witch time the Commission will look for alternatives to demolition. The outbuilding survey will not prioritize buildings—the 100 selected to inventory are a community-wide priority.

- Why should public money be used to "cleanout" a privately owned barn?
  The cleanout of the barn would be part of the demolition and construction; clean out involves both the removal items in the barn and also demolition and removal of rotten timbers, the crumbling foundation, roof shingles, and other building material that cannot be salvaged and reused. There are miscellaneous items in the barn, but not a significant amount. he budget in the report has the total cost of 'clean out and demolition' estimated at $5,000, about 6% of the project budget.

- Would the owners' insurance company be satisfied with the work the $70,000 could accomplish?
  It is the Historical Commission's understanding that the insurance company wants to reduce their liability because they view the barn as a hazard. Should the barn be restored, the insurance company would be satisfied. Town staff has discussed this

issue with Legal Counsel as this is a broader issue about the rights of private property owners.

- Would the barn be maintained in perpetuity so it doesn't fall into such disrepair in the future?
  The preservation restriction would require maintenance of the barn. Following the recommendations of report, restoration of the barn would replace the roof and siding, and would reinforce the timber frame and foundation. These improvements would result in a structure that would remain standing for another 100+ years with minimal maintenance.

Barn at 332 West Street, Amherst MA

Conditions Assessment and Scope of Work Report

January 2014

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Current Condition

The barn at 332 West Street (Route 116) in South Amherst comprises a c. 1900's 30' x 60' timber frame tobacco barn, with a 15' x 60' c. 1940's milking shed addition and concrete grain silo. The barn remains in its original location, fronting on Route 116, 2 miles south of Amherst center. It was constructed in the early 20th century as a tobacco barn, then was retrofitted as a dairy barn sometime in the early to mid-20th century. This retrofit included the addition of a hay track, loft and ground-level wood floors for hay storage, and concrete foundation piers and slab floors, as well as the milking shed and silo. Overall, the barn is in fair condition; the original timber-framed barn is in decent shape, though much of the later work to turn the tobacco barn into a dairy barn is in poor condition.

Original barn timber frame

The original barn structure is a square-ruled, late-era timber frame measuring 30'2" x 60'1". The frame features 5 bents, spaced at even 15' increments. Each bent has one center post, creating a two-aisled, four-bayed floor layout (please see attached drawings detailing floor plan and framing). The barn originally featured access to the two aisles through 2 pairs of large hung doors on the road (West) side, as well as two pairs of large hung doors on both the North and South sides of bay 4 (the farthest from the road). The barn was originally founded on field-stone piers, and clad in vertical pine boards and (interior) battens. The roof was skip-sheathed with pine slabs, and covered with wooden shingles.

Principal members of the frame are 7x7 circular-sawn timbers of mixed species, mostly chestnut, pine and hemlock, the different species seemingly used at random (although all sills appear to be chestnut). The bents include full 30' tie beams, which extend 3" past the post tops, and into which the interrupted wall plates are tenoned. Roof load is supported with a purlin system, with purlin posts rising plumb from mid-span between wall and center posts, to support spreader beams and interrupted purlin plates. The frame features simple square-rule joinery throughout, although the knee braces in the walls and the purlin system are butted and nailed, not joined (braces within the bents are joined with the usual bare-faced tenon joint). Rafters are single-span 2x6, plumb-cut and nailed at the peak and level-cut at the wall plate.

The frame overall is in fair condition, although some damage is evident:

-The spreader beams in bents 3-5 were removed from the frame to make way for the hay-track as part of the retrofit from tobacco barn to dairy barn, with no steps taken to account for the resulting loss of roof stiffness (Figure 12).

-Upper wall girts were removed all along the south wall, to allow for access to the upper storage level of the milking shed addition along that side.

-The north wall of the barn between bents 2 and 5 shows the most damage, from a combination of roof failure and foundation failure (Figure 6). The three wall plates in this section appear rotten and in need of repair or replacement, thanks to large leaks. The same leaks have caused the joint between post 4C and its tie beam and two plates to rot completely, and that rot in combination with foundation/sill failure has allowed post 4C to drop nearly 12", deforming the wall (Figures 2,3). Wall girts, tie beam ends, and post 5C may also need repair or replacement thanks to this water infiltration (Figure 4). Post 3C has been repaired in the last few decades, with the bottom 3' replaced with a pressure-treated 6x6, sistered on with a 2x6 fish plate (Figure 13).

-Sill beams, although made of chestnut which is renowned for its resistance to rot, are largely damaged and in need of repair or replacement. This is due to a variety of causes, including foundation failure, water infiltration due to roof leaks and rotted/missing sheathing, and concrete floors and foundation that partially or fully encase the beams (Figures 5,9).

Milking Shed

A 15'-wide shed was added along the entire south face of the barn at the time of the dairy retrofit, to serve as a milking shed. This shed is founded on concrete stem walls, and features a concrete slab floor with manure gutter. The walls of the shed framed with 4x4 principal members, butted and nailed, with roof and ceiling framing of 2x6 lumber. The ceiling of the shed forms a loft floor for the second level, accessible from the main barn and used for storage. The interior of the shed is coated in a lime whitewash, which along with the concrete floor and the discreet area used solely for milking reflects the recommended (and increasingly required) standards for U.S. dairying in the first part of the 20th century.

The milking shed is in fair to poor condition. While the wall framing is largely intact, at least half of the ceiling joists are rotted and failing, and a large number of the rafters are compromised (Figures 7,11). At some point in the last 30 years, repairs were made to rotten rafters with modern 2x6 sisters. The slab floor and the concrete stem-wall foundation are beginning to fail, and will continue to deteriorate.

Foundation and Slab

The original timber-framed barn was founded on field-stone piers, likely dry-stacked on grade, supporting the continuous 7x7 chestnut sill beams. At a later date, probably concurrently with the milking shed addition, formed concrete piers replaced the fieldstone piers. These concrete piers were poorly executed, not footed below frost and with the concrete partially encasing the sills, and most have failed or are beginning to fail (Figures 1,9). Additionally a concrete slab floor was poured in the south aisle of the main barn, partially encasing the sills; this slab is substantially cracked and heaved. The milking shed foundation and slab floor are failing due to frost heaving and (likely) improper footing (Figure 10).

Added Floors

With the dairy retrofit, two loft floor systems were added to the main barn, to store hay. These are simply framed, with 4x4 joists laid over carrying beams. Both are in poor condition, with substantial rot and failure thanks to roof leaks (Figure 4). There is also a wood-framed floor added at ground level to the north aisle of the barn; this is in as poor condition as the loft floors, for the same reasons.

Roof

The original roof covering consisted of wooden shake-shingles over pine slab skip-sheathing. These are still present, covered on the north pitch by at least one layer of asphalt roll roofing, and on the south side by some type of corrugated asphalt product. The south pitch is generally in better shape, but evidence of leaks are present, especially around the transition from main roof to the shallower pitch of the milking shed. The north pitch of the roof is in very poor condition, with many leaks and several gaping holes (Figures 3, 14).

Silo

Though silo structural analysis is outside the author's expertise, the silo and its foundation appear to be in sound condition. However the silo is located in front of the north aisle entrance, between the barn and the road, and the silo and the small connector leading from it to the barn block usage of the original hung doors into that aisle. The connector is thoroughly deteriorated, and causing problems at its intersection with the barn (Figure 8).

Site

The barn is well sited, located at the crest of a gentle hill, and does not have problems related to grade or drainage. However the ground immediately around the barn is overgrown with sumac, brambles and other vegetation, which will hold moisture against the building, and whose roots will eventually damage the foundation (Figure 15).

Recommended Scope of Work

Little information has been provided as to design or budget parameters for restoration or stabilization. The barn has been noted for its historic value to the town, serving as a physical reminder of the agricultural heritage of the area. However, the barn actually represents two eras of that agricultural heritage: the tobacco farming of the early 20th century, and the dairy farming of mid-century. If the barn is to be restored, to which configuration? Further, is the barn valued only aesthetically, as an important part of the view from the road? If so, the restoration does not need to concern itself with any other function - no electricity is needed, for example, nor storage lofts or large access doors. I found one clue in the Historic Commission's funding proposal to the Community Preservation Act Committee, which suggests that this barn may perhaps be used in the future by Grow Food Amherst or other local farmers. This potential use would dictate the need for the space to be restored to simple agricultural/storage function. The same funding proposal also acknowledges the possible need to demolish the milking shed, *"as this appears to be in sharp decline and was added later to the tobacco barn,"* signaling that the Historic Commission is open to a restoration to the original barn configuration.

Although little design direction has been provided by the Town, I was asked to model this assessment after one I completed for the North Amherst Community Farm last year, in which I detailed two scope-of-work scenarios, one to stabilize the building in the short term, and one to restore it to simple agricultural and storage function. These same scenarios are presented below. It should be noted that the attached cost estimates, while realistic and made in good faith, are merely preliminary estimates and should be used for preliminary budgeting purposes only. Exact costs can only be determined in a more intensive design and specification process.

Scenario One: Stabilization

If the town can not or does not choose to fully restore the barn right away, some steps can be taken to stabilize it and preserve it in the short term (5-15 years). This work can be performed as a stop-gap measure, to save the barn for restoration at a later date; however it does not address critical problems like foundation deterioration, and thus is only suited to short-term stabilization. The work is not aimed at creating a functional, useable space. The following work should be completed:

-Site work
  - Clear away the dense vegetation from around the barn, at least a 10' swath
- Barn clean-out and targeted demolition
  - Remove junk and debris from interior of barn, to facilitate work
  - Demolish and remove wooden loft floor systems
  - Demolish and remove connector from silo to barn
-Timber Frame Repair
  -"Quick and dirty" repairs should be made at crucial points in the timber frame. These repairs should not harm the frame or its original material in any way, so that proper long-term repairs can be made later. The repairs will vary in each location, but will utilize metal plates and brackets to strengthen joints, dimensional lumber braces and sisters to stiffen timbers, and cribbing and bolts to stabilize post feet. In some places, particularly post 4C, some jacking will need to be done to perfunctorily straighten frame deformations. Areas in need of this work include north wall plates 3-4 and 4-5; posts 3C, 4C, 5C; north end of tie beam 4; spreader beams 3-5; all post feet.
-Sheathing repair
  -In places where vertical board sheathing is missing or compromised, new sheathing should be installed. This includes sections of the north wall, and the west wall at intersection with the silo connector.
-Roof repair
  -Strengthen any damaged rafters with 2x6 sisters
  -Strip existing asphalt roof covering
  -Strip wooden shingles, and repair rotted board sheathing as needed. If the majority of sheathing

seems suspect, a layer of ½" plywood sheathing may be added over the board sheathing
-Apply corrugated steel roof. Generally a standing-seam steel roof is preferable to corrugated steel, however as future restoration work and jacking would likely damage or require the removal of a standing seam roof, corrugated is recommended for this scenario.

-Soft Costs

-Typical costs for permitting, contracting, architectural and engineering services run 15-20% of total project cost. It's possible that the Town's connections to design and permitting professionals may produce cost savings here. I've added 15% for soft costs.

Scenario One Cost Estimate: $26,910

Site Work: $1200
Clean-Out and Demolition: $5000
Timber Frame Stabilization: $6000
Sheathing: $1200
Roof: $10000

Sub-Total: $23,400
+ 15% Soft Costs: $3510
Total: $26,910

Scenario Two: Restoration

To address all of the problems currently evident, and restore the barn to good and useable condition, the following work should be undertaken.

-Site work
- Clear away the dense vegetation from around the barn, at least a 10' swath

-Barn clean-out and demolition
- Clean out and dispose of all junk
- Demolish and remove wooden loft floor systems, and wood floor at ground level in north aisle
- Demolish and remove milking shed
- Demolish and remove connector from silo to barn
- Demolish and remove milking shed foundation and slab
- Demolish and remove slab floor in south aisle

-Foundation, Sills and Post Feet
- Jack posts, remove failed piers, dig holes and pour new concrete footers and piers
- Install new sill beams onto new piers
- Where needed, repair or re-cut post feet, then lower posts into new sills and piers

-Timber frame repair

-Make repairs where needed to restore frame to sound condition. Repairs should utilize bona fide, wood-to-wood connections such as slip tenons, dutchmen, and scarf joints, matching the original joinery in the existing frame. At minimum, this includes:

-Replace spreader beams 3-5
-Repair or replace posts 4C and 5C
-Replace wall plates 3C-4C and 4C-5C
-Replace upper wall girts in north wall
-Repair north end of tie beam 4

-Roof repair

-Strengthen any damaged rafters with 2x6 sisters

-Strip existing asphalt roof covering

-Strip wooden shingles, and repair rotted board sheathing as needed. If the majority of sheathing seems suspect, a layer of ½" plywood sheathing may be added over the board sheathing

-Apply standing-seam steel roof.

-Sheathing Repair

-Replace board sheathing where currently missing or compromised. Care should be taken to salvage the maximum possible amount of original material; where only the bottom ends of boards are damaged, new boards should replace only the bottom damaged section, with a beveled joint breaking on the nearest convenient girt nailer.

-Re-sheath south wall after demolition of milking shed, with interior battens and boards, replicating original sheathing detail.

-Doors and Windows

-Recreate main access to the barn in the original configuration, with twin entrances on the west (road-side) gable, accessing both main aisles of the barn. The original sets of hung doors should be re-used, but attached to sliding door track, as has been done on the south aisle entrance. These sliders will travel on two separate tracks, one on the exterior face of the barn, and one on the interior of the gable wall, to allow both doors to open without interfering with one another.

-The original hung-door access at the north and south ends of bay 4 does not need to be re-created; the west gable entrances will provide sufficient access.

-The only windows currently in the main 30x60 barn are a few fixed barn-sash, in the east gable wall. These are likely not original, as tobacco barns did not typically feature windows. Whether or not the restored structure should keep these windows, or add more barn sash on other walls, is an open question that will need to weigh the imperative for historic accuracy with the potential future function of the barn and the practical benefit of natural light. For this scenario, it's assumed that no windows are added.

-Electric

- It's not known if there is currently electric service to the barn, or if this service is adequate for simple agricultural and storage use. The site visit did not turn up evidence of any panel or wiring, so it's assumed that new service is needed. Electric work is assumed to be minimal, with a service connected by an aerial drop, and a new panel serving around six GFCI outlets in the ground level of the barn, with around 6 simple barn lighting fixtures installed, served by a pole switch.

-Soft Costs

-Typical costs for permitting, contracting, architectural and engineering services run 15-20% of total project cost. It's possible that the Town's connections to design and permitting professionals may produce cost savings here. I've added 15% for soft costs.

-*Silo*

-Depending on the desires of the Town, the concrete silo and its foundation could be left in place, or demolished and removed. As a later addition, it does not hold historic value as part of the original iteration of the barn. However it appears to be in sound condition and does not negatively affect the barn. Its demolition and removal would add significant cost to any restoration; this cost is not included in the estimate below.

Scenario Two Cost Estimate: $81,880

Site Work: $1200
Clean-Out and Demolition: $15,000

Foundation, Sills and Post Feet: $12,000
Timber Frame Repair: $16,000
Sheathing: $5000
Doors: $3000
Roof: $16,000 (24 square x $650/square installed)
Electric: $3000

Sub-Total: $71,200
+ 15% Soft Costs: $10,680
Total: $81,880

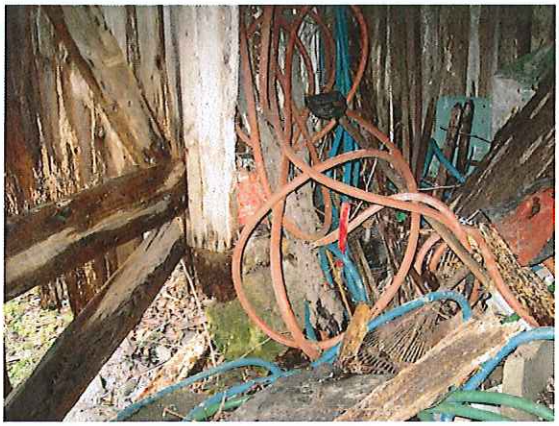


Figure 1. Condition at North East corner (5C). Note concrete foundation pier rolling outwards.

Figure 2. Connection at top of post 4C, showing rotted ends of tie beam 4, plate 3C-4C, and resulting drop of post and plate.

Figure 3. View of plate 3C-4C, showing roof leak and resulting rot of sheathing, rafters, and plate.

Figure 4. Loft floor in North East corner (5C), showing effects of major roof leak on loft floor and framing.

Figure 5. Condition of sheathing and sill along wall C. Note remains of original fieldstone foundation, amongst rotted remains of sill.

Figure 6. View of North wall (wall C). Roof leaks and foundation failures have combined to deform the frame, immediately apparent from the exterior, especially near post 4C.

Figure 7. View into upper level of milking shed. Note sisters on majority of rafters, and rotted joists and loft flooring.

Figure 8. Silo, barn and connector. Connector has completely failed, and is leading to deterioration of barn sheathing and framing.

Figure 9. Concrete pier under door post near post 1B. Note sill encased in concrete, and resulting damage.

Figure 10. Foundation stem wall and slab along south wall of milking shed. Note outward lean of stem wall and visible cracking.

Figure 11. View of milking shed lower level, showing rotted and failing joists.

Figure 12. Purlin system, at bent 3, showing missing spreader beam. Intact spreader beam can be seen at bent 2 in background.

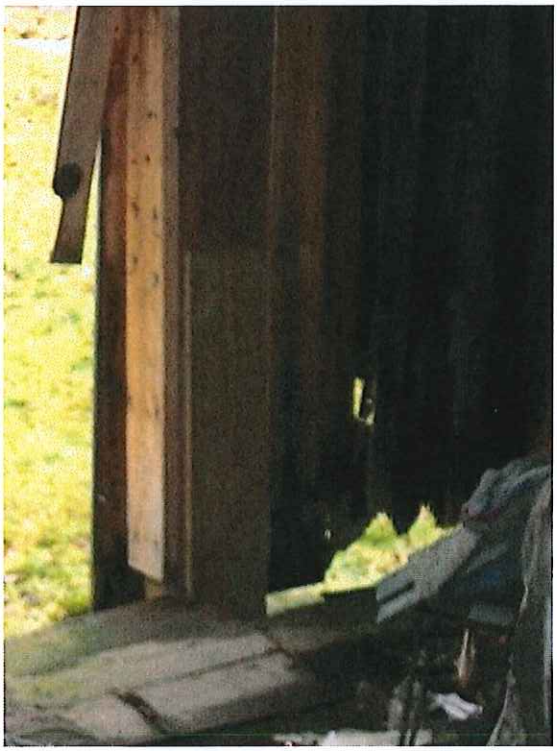
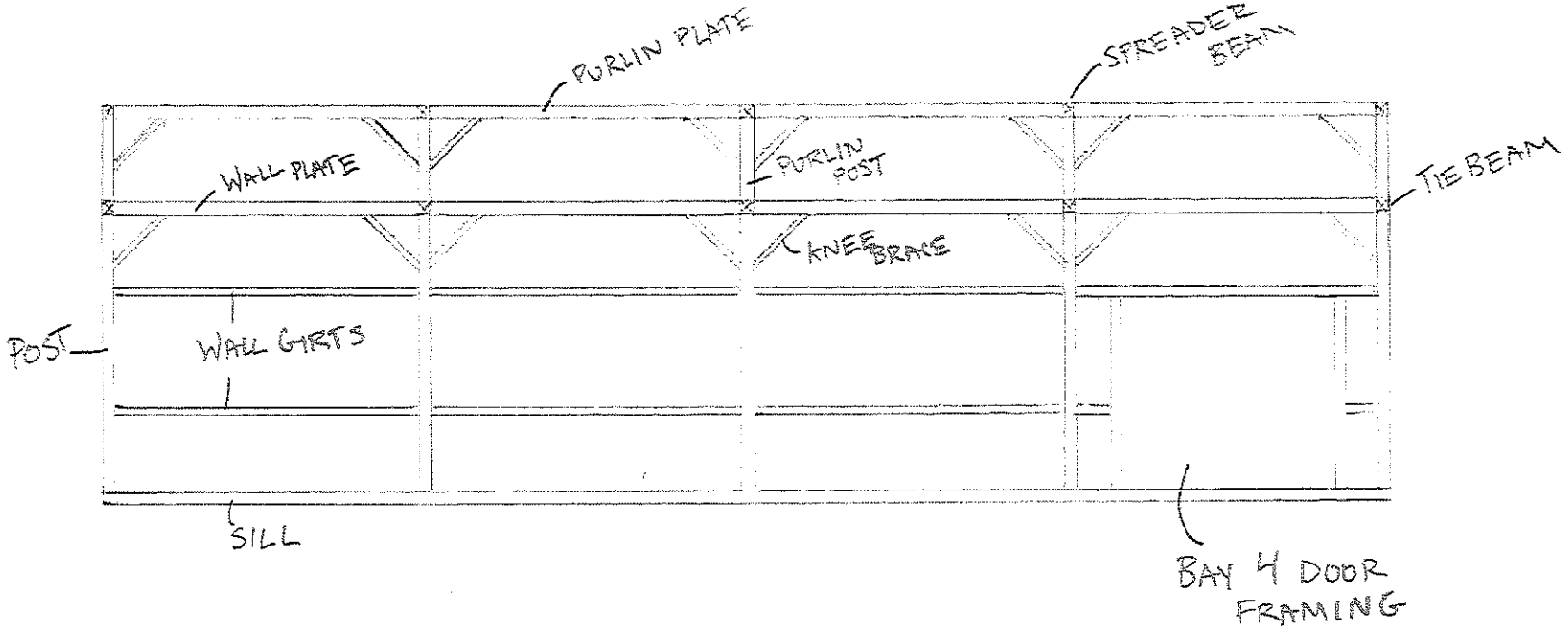


Figure 13. View of inadequate repair at bottom of post 3C.

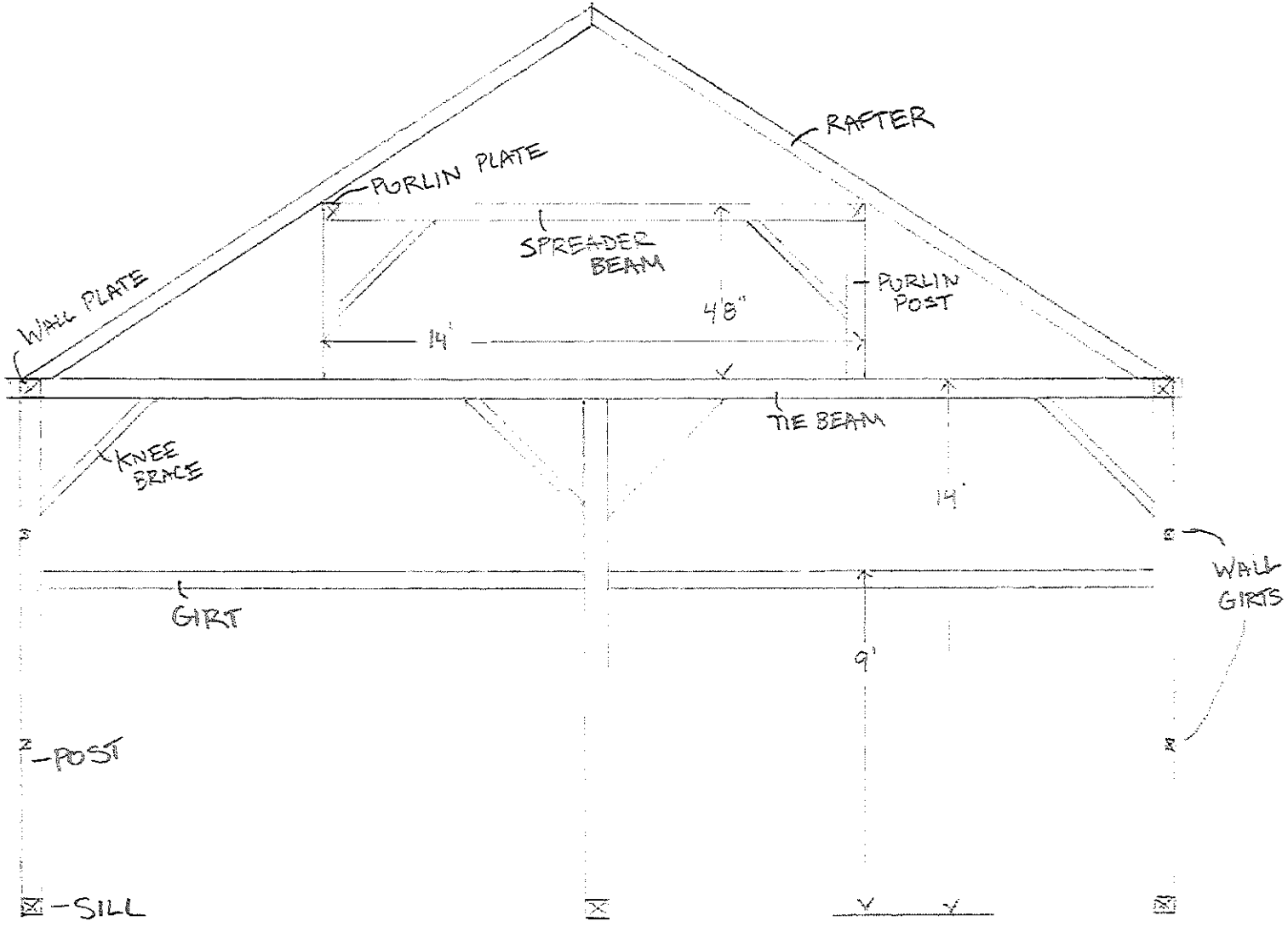
Figure 14. Hole in north pitch of roof, showing asphalt roll roofing and underlying wood shingles.

Figure 15. Overgrowth at perimeter of barn.

TYPICAL WALL FRAMING/BARN AT 332 WEST ST / 1/8"=1' / GUSAKOV WOODWORKS



TYPICAL BENT FRAMING / BARN AT 332 WEST ST / 1/4" = 1' / GUSAKOV WOODWORKS



POST PLAN AND LAYOUT / BARN AT 332 WEST ST / 1/8"=1' / GUSAKOV WOODWORKS